

#### ABSTRACT

A sound reproduction system has been developed for converting signals on two input channels into surround signals on five or seven output channels and vice-versa. A decoder is included that enhances the correlated component of the input signals in the desired direction and reduces the strength of such signals in channels not associated with the encoded direction, while preserving the apparent loudness of all output channels, the separation between the respective left and right output channels and the total energy of the uncorrelated component of the input channels in each output channel. Included within the decoder is a uniquely defined matrix that helps to ensure that the surface of the output signals is smooth and continuous. An encoder is also included which encodes five or seven channels of sound into two so the two channels may be decoded by a variety of decoders with the correct sound direction and level.